HISTORIC COLUMBIA RIVER HIGHWAY,
EAGLE CREEK BRIDGE
Troutdale vicinity
Multnomah County
Oregon

HAER No. OR-36-P

HAER
ORE
26-TROUT.V
1P-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

HISTORIC AMERICAN ENGINEERING RECORD

HISTORIC COLUMBIA RIVER HIGHWAY, EAGLE CREEK BRIDGE

HAER No. OR-36-P

Location:	Spanning Eagle Creek along the Historic Columbia River Highway, Multnomah County, Oregon, beginning at milepost 42.7. UTM: 10/582620/5054520 Quad: Bonneville Dam, Wash.--Oreg.
Date of Construction:	1915
Engineer:	K. P. Billner and Lewis W. Metzger, designing engineers, Oregon State Highway Department
Builder:	Pacific Bridge Company, Portland
Owner:	Oregon Department of Transportation
Present Use:	Vehicular and pedestrian traffic
Significance:	The only stone-veneered reinforced-concrete arch bridge and one of only eight arch spans on the Historic Columbia River Highway. It is the last bridge in the Multnomah County section of the Historic Columbia River Highway.
Historian:	Robert W. Hadlow, Ph.D., September 1995
Transmitted by:	Lisa M. Pfueller, September 1996

PROJECT INFORMATION

This recording project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. The HAER program is administered by the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) Division of the National Park Service, U.S. Department of the Interior. The Historic Columbia River Highway Recording Project was cosponsored in 1995 by HABS/HAER, under the general direction of Robert J. Kapsch, Ph.D., Chief, and by the Oregon Department of Transportation (ODOT), Bruce Warner, Region One Manager; in cooperation with the US/International Committee on Monuments and Sites (ICOMOS), the American Society of Civil Engineers (ASCE), and the Historic Columbia River Highway Advisory Committee.

Fieldwork, measured drawings, historical reports, and photographs were prepared under the direction of Eric N. DeLony, Chief of HAER; Todd A. Croteau, HAER Architect, and Dean A. Herrin, Ph.D., HAER Historian. The recording team consisted of Elaine G. Pierce (Chattanooga, Tennessee), Architect and Field Supervisor; Vladimir V. Simonenko (ICOMOS/Academy of Fine Arts, Kiev, Ukraine), Architect; Christine Rumi (University of Oregon) and Pete Brooks (Yale University), Architectural Technicians; Helen I. Selph (California State Polytechnic University, Pomona) and Jodi C. Zeller (University of Illinois, Urbana-Champaign), Landscape Architectural Technicians; Robert W. Hadlow, Ph.D. (ASCE/Pullman, Washington), Historian; and Jet Lowe (Washington, DC), HAER Photographer. Jeanette B. Kloos, ODOT Region One Scenic Area Coordinator; and Dwight A. Smith, ODOT Cultural Resources Specialist, served as department liaison.

Additional information about the Historic Columbia River Highway can be found under the following HAER Nos.:

OR-36	HISTORIC COLUMBIA RIVER HIGHWAY
OR-36-A	HISTORIC COLUMBIA RIVER HIGHWAY, SANDY RIVER BRIDGE AT TROUTDALE
OR-36-B	HISTORIC COLUMBIA RIVER HIGHWAY, SANDY RIVER BRIDGE (Stark St. Bridge)
OR-36-C	HISTORIC COLUMBIA RIVER HIGHWAY, CROWN POINT VIADUCT
OR-36-D	HISTORIC COLUMBIA RIVER HIGHWAY, CROWN POINT
OR-24	LATOURELL CREEK BRIDGE
OR-23	SHEPPERDS DELL BRIDGE
OR-36-E	HISTORIC COLUMBIA RIVER HIGHWAY, BRIDAL VEIL FALLS BRIDGE

OR-36-F	HISTORIC COLUMBIA RIVER HIGHWAY, WAHKEENA FALLS FOOTBRIDGE
OR-36-G	HISTORIC COLUMBIA RIVER HIGHWAY, WEST MULTNOMAH FALLS VIADUCT
OR-36-H	HISTORIC COLUMBIA RIVER HIGHWAY, MULTNOMAH CREEK BRIDGE
OR-36-I	HISTORIC COLUMBIA RIVER HIGHWAY, MULTNOMAH FALLS FOOTBRIDGE (Benson Footbridge)
OR-36-J	HISTORIC COLUMBIA RIVER HIGHWAY, EAST MULTNOMAH FALLS VIADUCT (Bridge No. 841)
OR-36-K	HISTORIC COLUMBIA RIVER HIGHWAY, ONEONTA GORGE CREEK BRIDGE
OR-36-L	HISTORIC COLUMBIA RIVER HIGHWAY, ONEONTA TUNNEL
OR-36-M	HISTORIC COLUMBIA RIVER HIGHWAY, HORSETAIL FALLS BRIDGE
OR-49	MOFFETT CREEK BRIDGE
OR-36-N	HISTORIC COLUMBIA RIVER HIGHWAY, TOOTHROCK & EAGLE CREEK VIADUCTS
OR-36-O	HISTORIC COLUMBIA RIVER HIGHWAY, TOOTHROCK TUNNEL
OR-36-Q	HISTORIC COLUMBIA RIVER HIGHWAY, EAGLE CREEK RECREATION AREA (Forest Camp)
OR-36-R	HISTORIC COLUMBIA RIVER HIGHWAY, MITCHELL POINT TUNNEL & VIADUCT (Tunnel of Many Vistas)
OR-36-T	HISTORIC COLUMBIA RIVER HIGHWAY, MOSIER TWIN TUNNELS
OR-36-U	HISTORIC COLUMBIA RIVER HIGHWAY, MOSIER CREEK BRIDGE (Bridge No. 498)
OR-30	DRY CANYON CREEK BRIDGE
OR-27	MILL CREEK BRIDGE
OR-56	COLUMBIA RIVER HIGHWAY BRIDGES

For shelving purposes at the Library of Congress, Troutdale vicinity in Multnomah County was selected as the "official" location for the various structures in the Historic Columbia River Highway documentation project (HAER No. OR-36).

HISTORIC COLUMBIA RIVER HIGHWAY

The Pacific Northwest's Columbia River Highway, later renamed the Historic Columbia River Highway (HCRH), was constructed between 1913 and 1922. It is one of the oldest scenic highways in the United States. Its design and execution were the products of two visionaries: Samuel Hill, lawyer, entrepreneur, and good roads promoter and Samuel C. Lancaster, engineer and landscape architect, with the assistance of several top road and bridge designers. In addition, many citizens provided strong leadership and advocacy for construction of what they saw as "The King of the Roads."

Often, the terms "scenic highways" and "parkways" are used synonymously. Scenic highways are best described as those roads constructed to provide motorists with the opportunity to see up-close the landscape's natural beauty. Parkways are roads or streets often associated with city beautiful campaigns prevalent in the United States in the late 19th and early 20th centuries. They were part of a movement to create park-like settings out of wastelands. Many of the scenic highways in the United States are associated with the country's national park system and were built in the years following the First World War.

Beginning in the 1910s and early 1920s, the National Park Service (NPS) began construction of well-engineered paved roads with permanent concrete and masonry bridges and viaducts to make its park sites more accessible to an increasingly mobile tourist population. These included roads such as "Going-to-the-Sun Highway" in Glacier National Park and "All-Year Highway" in Yosemite National Park. The Historic Columbia River Highway, unlike many of its counterparts, was constructed through county-state cooperation. It became a state-owned trunk route or highway, part of a growing system of roads that criss-crossed Oregon.

Samuel Hill, once an attorney for James J. Hill and his large railroad empire, and later a Pacific Northwest investor and entrepreneur, was the state of Washington's most vocal good roads' spokesman in the late 19th and early 20th centuries. He promoted good roads at Seattle's Alaska-Yukon-Pacific Exposition in 1905, and shortly thereafter helped to establish the department of highway engineering at the University of Washington. With little success in convincing the Washington State Legislature to fund a major highway along the Washington side of the Columbia River, Hill found more receptive ears and pocketbooks with Oregon lawmakers and Portland area businessmen. Construction began on the HCRH in 1913. By 1922, it was

complete, covered in a long-wearing and smooth-riding asphaltic-concrete pavement.[1]

Hill hired Samuel Lancaster, an experienced engineer and landscape architect to design the Historic Columbia River Highway. Lancaster was noted for the boulevards that he created around Seattle's Lake Washington in the first decade of the 20th century as a component of the city's Olmsted-designed park system. In 1909 Lancaster became the first professor of highway engineering in Hill's department at the University of Washington. Lancaster accompanied Hill and others to Paris in 1908 for the First International Road Congress, and afterwards the delegation toured western Europe to learn about continental road-building techniques. Seeing roads in the park-like setting of the Rhine River Valley inspired Hill to build a highway along the Columbia River Gorge. By 1912, Lancaster was conducting road-building experiments at Hill's estate, Maryhill, 100 miles east of Portland on the Washington side of the Columbia. The route they subsequently created was not a parkway, in the truest sense, but instead a scenic highway.[2]

The Columbia River Gorge's natural features distinguish it as the ideal setting. This relationship between the natural landscape and the Historic Columbia River Highway was described best by locating engineer John Arthur Elliott. He wrote, "All the natural beauty spots were fixed as control points and the location adjusted to include them." The road passed several waterfalls and rock outcroppings, including Thor's Heights (Crown Point), Latourell Falls, Shepperd's Dell, Bishop's Cap, Multnomah Falls, Oneonta Gorge and Falls, Horsetail Falls, Wahkeena Falls, and Tooth Rock. Natural features were made an integral component of the Historic Columbia River Highway.[3]

According to Lancaster, "There is but one Columbia River Gorge [that] God put into this comparatively short space, [with] so many beautiful waterfalls, canyons, cliffs and mountain domes." He believed that "men from all climes will wonder at its wild grandure [*sic*] when once it is made accessable [*sic*] by this great highway." In addition, the promoters sought to create a route that utilized the most advanced techniques available for road construction. In reflecting on the work's progress, Lancaster acknowledged that because of the country's rugged climate, with its wind and rain and winter weather, it had been "slow and tedious and somewhat more expensive than ordinary work." Nevertheless, he and his associates felt they were accomplishing a worthwhile task because, "for if the road is completed according to plans, it will rival if not surpass anything to be found in the civilized world."[4]

In an more practical light, many observers saw the HCRH as a lifeline connecting Portland with the many commercial and agricultural areas along the Columbia River. Some even envisioned it as part of a spider web of similarly constructed routes radiating out towards central and eastern Washington and northern Idaho, and meeting routes leading to other parts of the region and nation.

The Historic Columbia River Highway was a technical and civic achievement of its time, successfully mixing sensitivity to the magnificent landscape and ambitious engineering. The highway has gained national significance because it represents one of the earliest applications of cliff-face road building as applied to modern highway construction. Lancaster emulated the European styles of road building in the Columbia River Gorge, while also designing and constructing a highway to advanced engineering standards. Throughout the route, engineers held fast to a design protocol that included accepting no grade greater than 5 percent, nor laying out a curve with less than a 200' turning radius. In rare cases where a tighter curve was used, Lancaster reduced grades and widened pavement. The use of reinforced-concrete bridges, combined with masonry guard rails, guard walls, and retaining walls brought together the new with the old - the most advanced highway structures with the tried and tested. In building the HCRH, Lancaster artfully created an engineering achievement sympathetic to the natural landscape.[5]

In the days before the formation of a comprehensive state highway plan, Multnomah, Hood River, and Wasco counties cooperated, sometimes unwillingly, with the newly-formed Oregon State Highway Commission (1913) in constructing the HCRH. Initially a group of recently elected Multnomah County commissioners, strong supporters of the proposed route, resolved that the highway commission take charge of its road building activities, with access to $75,000 in county tax revenues. Soon crews surveyed the route through Multnomah County and constructed one mile of road.

Boosters stumped for the route's completion to the Hood River County line. Local clubs sent out men and boys for weekend work parties to show public support for the undertaking. One photograph from the period, depicts work parties with picks and shovels in hand and placards such as "Gang No. 7, Portland Ad Club, Stalwarts," or "Gang No. 3, Portland Realty Board, We will ROCK the Earth." The highway received much patronage, although some citizens were less than enthusiastic about its construction. Opponents showed their views with placards declaring, "I WON'T WORK, To Hell With Good Roads, We Don't Own Autos." Many "mossbacks" had no use for good roads and were satisfied

traveling the network of rutted, narrow, steeply-graded backwoods trails. Nevertheless, the public generally supported the highway's construction. Multnomah County Commissioners levied a direct tax sufficient to fund road building to the Hood River County line, and subsequently, the people voted a $1 million bond issue to pave the road with asphalt.[6]

Other counties similarly supported this scenic highway innovation. In 1914, Hood River County voters approved the sale of $75,000 in bonds to initiate their portion of the road's construction. Finally, in 1915, Wasco County commissioners financed a survey to locate the route through their jurisdiction. By 1916, though, the state highway commission was reorganized and given a greater mandate over state highway construction, taking much of it out of local hands. Passage of the Federal Aid Road Acts of 1916 and 1921 gave the Oregon State Highway Commission matching funding to complete the Historic Columbia River Highway through Wasco County, and eventually to complete the route to its eastern terminus at Pendleton, in Umatilla County, by the early 1920s. At the same time, the state, working with counties west of Portland, completed another portion of the Columbia River Highway to the sea at Astoria. Eventually it became part of the national highway system and was designated part of U.S. 30.[7]

By the late 1930s, construction of Bonneville Dam, a New Deal project aimed at providing flood control on the Columbia River and generating electricity, caused a realignment of a portion of the HCRH near Tooth Rock and Eagle Creek, in eastern Multnomah County. It was evident that the old highway was too outdated to provide safe efficient travel for modern motor traffic. By 1954 it was bypassed in its entirety from Troutdale to The Dalles by a new water-level route. This new road was subsequently upgraded to a four-lane divided roadway and eventually renamed Interstate 84. Only portions of the old route remained as a reminder of its early modern highway engineering accomplishments.

EAGLE CREEK BRIDGE

The Eagle Creek Bridge is the easternmost span on the Historic Columbia River Highway in Multnomah County. It spans a large stream emptying into the Columbia just east of Tooth Rock, which marks the crest of the Cascade Range. The HCRH's alignment at Eagle Creek caught the attention of Oregon National Forest Service supervisor Tom Sherrard. He believed the small timbered valley, over 40 miles east of downtown Portland, was an ideal location for picnics and overnight camping for motorists. Completed in 1915, the 25-acre Eagle Creek Campground became the

first improved U.S. Forest Service camping area the country. It had a capacity of 2,000 persons at a time and attracted tens of thousands of visitors during summer months.[8]

DESIGN AND DESCRIPTION

The Eagle Creek Bridge is a 100'-0" reinforced-concrete and masonry structure consisting of a 60'-0" three-ribbed semi-circular concrete arch with 20'-0" concrete slab span approaches and masonry abutments. Width is about 23' with a 20'-0" roadway. Overall length is 144'-0". The reinforced-concrete deck is built on a grade, running from west to east at 4 percent and is covered with an asphalt wearing surface.[9]

The arched ribs, tapered from springlines to crowns, rest on wide, flat concrete footings with only a 6" curb to counteract longitudinal thrust. The structural system above the arch consists of three spandrel walls. These walls are made of plain square spandrel columns with intermediate longitudinal struts, and counterbraced by transverse struts. Column seats were poured as part of the extradosal surface of the arch ribs. At each end of the arch, the structure included diagonal reinforced-concrete sway bracing. The floor system, above the spandrel walls, consisted of a reinforced-concrete deck resting on both transverse and longitudinal beams, with an integrated transverse "Haunch Beam" on top of the arch ribs at mid-span.[10]

This bridge is the smallest of the arch spans on the Historic Columbia River Highway and is the only one with a semi-circular shape. It is unique among the larger reinforced-concrete spans, and in particular the reinforced-concrete arches on the HCRH, because it was the only one veneered in native stone, hiding from motorists and pedestrians its complicated structural configuration. The same Italian masons who created the great variety of guard rails, guard walls, and retaining walls along the length of the HCRH also created the stonework seen on the Eagle Creek Bridge. It is possible that Samuel Lancaster suggested the use of stone veneer on this structure because it reflected design elements that he had seen in Germany and Italy during his 1908 trip to the First International Road Congress in Paris and subsequent travels to western and southern Europe to research road building. Lancaster also owned property in the vicinity of Eagle Creek and eventually built a lodge and cabins there as part of a small resort. He may have also seized the opportunity to "dress up" this bridge to compliment the design plans he had for his nearby 72 acre rustic resort, Lancaster's Lodge.[11]

The veneer on the east and west elevations was created from mortared random rubble basalt surrounding ashlar voussoirs. Approach span masonry consisted of 1:4 battered mortared walls. Rock courses were attached to the bridge's concrete skeleton by a system of horizontal longitudinal anchor rods and transverse looped rods. Once masons had attached the stone veneer to the structure, they plastered the back side of the rock wall with mortar for structural stability. The railings consisted of slip joint rubble walls with regularly-spaced semi-circular arched drainage openings. They were topped with screeded concrete caps. The railing treatment provided continuity with the Historic Columbia River Highway's standardized guard fences adjoining the bridge from the west and east.

One additional feature at Eagle Creek was a masonry pedestrian viewing platform running at right angles to the roadway near the west abutment of the bridge. It began as a large rock jutting out to the north of the roadway, but masons enclosed it with a rubble wall. Travelers could look out to the north from this safe viewing platform and see the rushing waters of Eagle Creek as it emptied into the Columbia River. Built of railings and posts similar to those on the bridge, the balcony has integral concrete benches anchored into the walls and braced by rock bracketing.[12]

REPAIR AND MAINTENANCE

Maintenance records for the Eagle Creek Bridge were lost or no longer exist. The bridge itself has received only minor alterations since its construction. It was bypassed in the late 1930s when the Historic Columbia River Highway around Tooth Rock and Eagle Creek was relocated as part of the Bonneville Dam construction nearby on the Columbia River. The dam's backwaters threatened the Oregon-Washington Railroad and Navigation Company's mainline, forcing the company to move the rail line. This, in turn, required realigning the HCRH, bypassing the Toothrock and Eagle Creek viaducts with a tunnel through Tooth Rock and creating a new water-level route. The Oregon State Highway Department's bridge engineer, Conde B. McCullough, and his designers, created a three-span steel through tied arch over Eagle Creek, just east of the new tunnel. The old Eagle Creek Bridge then only provided service to the nearby Eagle Creek Campground and the newly constructed Eagle Creek Viewpoint.[13]

As part of the New Deal make-work programs of the 1930s, the Civilian Conservation Corps remodeled and enlarged the Eagle Creek Campground to include a new area north of the old bridge and the new highway alignment. It provided space for 3,000 additional campers and picnickers, and a viewpoint for observing

construction on Bonneville Dam. At this point, the east masonry approach to the Eagle Creek Bridge was shortened and realigned, fanning out nearly symmetrical. This change provided motorists the ability to drive to the right (south) to the Eagle Creek Camp, or to the left (north)and under the new road and railroad alignments to the Eagle Creek Viewpoint.[14]

Beginning some time in the 1960s, as the realigned U.S. 30 was upgraded to a four-lane divided highway (Interstate 80N, later renamed Interstate 84), the portion of the HCRH around Eagle Creek served only as an off-ramp to access the campground and a nearby fish hatchery. The hatchery, which opened in the late 1950s, has installed a manhole in the bridge deck, along with a catwalk and valve mechanism inside the structure that permits it to operate a pumping system that diverts water to its facilities.

With Bonneville Dam's completion in the late 1930s, the unharnessed, naturally-flowing Columbia River was forever changed. The dam's backwaters affected many streams that emptied into the river. For Eagle Creek this meant that the shallow fast-flowing brook became a deep, slow-flowing stream. Consequently, arch abutments and structural members on Eagle Creek Bridge that were never meant to be underwater for long periods are now almost continuously submerged. This, along with the passage of time, has caused some spalling on parts of the span's superstructure.

ENDNOTES

[1]For good syntheses of the Pacific Northwest good roads' movement, see John Kevin Rindell, "From Ruts to Roads: The Politics of Highway Development in Washington State" (M.A. thesis, Washington State University, 1987) and Hugh M. Hoyt, Jr., "The Good Roads Movement in Oregon, 1900-1920" (Ph.D. diss., University of Oregon, 1966); Oral Bullard, *Lancaster's Road: The Historic Columbia River Scenic Highway* (Beaverton, OR: TMS Book Service, 1982): 31; Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 112.

[2]Fahl, "S. C. Lancaster and the Columbia River Highway," 105-07.

[3]John Arthur Elliott, "The Location and Construction of the Mitchell Point Section of the Columbia River Highway" (C.E. thesis, University of Washington, 1929): 3.

[4]Samuel C. Lancaster to Amos S. Benson, 7 February 1914, folder "Multnomah County, 1914," box 4, RG 76A-90, Oregon State Archives, Salem.

[5]Dwight A. Smith, "Columbia River Highway Historic District: Nomination of the Old Columbia River Highway in the Columbia Gorge to the National Register of Historic Places, Multnomah, Hood River, and Wasco Counties, Oregon" (Salem, OR: Oregon Department of Transportation, Highway Division, Technical Services Branch, Environmental Section, 1984): 3.

[6]Ronald J. Fahl, "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist," *Oregon Historical Quarterly* 74, no. 2 (June 1973): 111; Samuel C. Lancaster, "The Revelation of Famous Highways: A Symposium,"in *American Civic Annual* (n.p., 1929): 109.; see photograph in the Oregon Historical Society collection, negative no. 38744; C. Lester Horn, "Oregon's Columbia River Highway," *Oregon Historical Quarterly* 66, no. 3 (September 1965): 261.

[7]*Second Annual Report of the Engineer of the Oregon State Highway Commission* (Salem, 1916): 26-30.

[8]Oregon National Forest later became Mount Hood National Forest. "Bonneville Lake . . . Boon to Recreation Seekers," *Portland Oregonian* (5 September 1937): 10.

[9]A. A. Rosenthal, "Structural Features of a Great Scenic Highway," *Contracting*, June 1916, reprint, 8.

[10]See HAER drawing for Eagle Creek Bridge, HAER No. OR-81, Historic Columbia River Highway Recording Project, 1995, Pete Brooks, delineator. Brooks interpreted original elevation and section drawings found in Bridge No. 2063A, Microfiched Correspondence Files, Bridge Section, ODOT, Salem.

[11]See HAER Inventory Card, Eagle Creek Bridge," in Historic American Engineering Record Inventory Cards: Columbia River Scenic Highway," prepared by Dwight A. Smith, Highway Division, Oregon Department of Transportation, August 1981. Lancaster bought 72 acres south of the highway near Toothrock and Eagle Creek where he built a rustic resort of tent cabins and a lodge. It included nature trails, and wooded retreats. Lancaster's Lodge burned down and he subsequently sold the land. It eventually became Bonneville State Park, land left undeveloped for scenic protection. See *Oregon's Highway Park System, 1921-1989: An Administrative History* (Salem: Oregon Parks and Recreation Department, 1992): 157. See also, Fahl, "S. C. Lancaster and the Columbia River Highway," 128-31.

[12]Samuel Christopher Lancaster, *The Columbia: America's Great Highway through the Cascade Mountains to the Sea* (Portland, 1916): 96.

[13]"Bonneville Lake . . . Boon to Recreation Seekers," 10.

[14]See "Job List completed with Aid of CCC men for period July 23 to Aug 3; ECW, Columbia Gorge District, Mount Hood National Forest, memorandum, 5 November 1934; A. O. Waha, Forest Supervisor, to Regional Forester, 16 April 1935; Albert Wiesendanger, Senior Forest Ranger, Eagle Creek Forest Camp, memorandum, 28 October 1935; Albert Wiesendanger, Eagle Creek Camp, memorandum, for Information Ranger Williamson, all in file "2330--Development of Sites in Public Sector, Eagle Creek Recreation Area, 4-20," in Supervisor's Office, Mount Hood National Forest, Gresham, Oregon.

SOURCES CONSULTED

Allen, John Eliot. *The Magnificent Gateway: A Layman's Guide to the Geology of the Columbia River Gorge*. Forest Grove, OR: Timber Press, 1979.

Fahl, Ronald J. "S. C. Lancaster and the Columbia River Highway: Engineer as Conservationist." *Oregon Historical Quarterly* 74, no. 2 (June 1973): 101-44

Historic American Engineering Record Inventory Cards: Columbia River Scenic Highway." Prepared by Dwight A. Smith, Highway Division, Oregon Department of Transportation, August 1981.

Horn, C. Lester. "Oregon's Columbia River Highway." *Oregon Historical Quarterly* 66, no. 3 (September 1965): 249-71.

Lancaster, Samuel Christopher. *The Columbia: America's Great Highway through the Cascade Mountains to the Sea*. Portland, 1916.

Lancaster, Samuel C. "The Revelation of Famous Highways: A Symposium." In *American Civic Annual* (n.p., 1929): 107-11.

Lockley, Fred. *History of the Columbia River Valley from The Dalles to the Sea*. Chicago: S. J. Clarke Publishing Co., 1928.

Oregon Department of Transportation. Bridge Section. Files

Oregon State Highway Department. *Annual* and *Biennial Report*. Salem, 1914-22.

Oregon's Highway Park System, 1921-1989: An Administrative History. Salem: Oregon Parks and Recreation Department, 1992.

Portland Oregon Journal, 1913-40.

Portland Oregonian, 1913-40.

Orr, Rick, and Stephen Dow Beckham. "Cultural Resource Overview and Investigations for the Bonneville Navigation Lock Project, Oregon and Washington." For the U.S. Army Corps of Engineers. 1984.

Rosenthal, A. A. "Structural Features of a Great Scenic Highway." *Contracting*, June 1916, reprint.

Smith, Dwight A. "Columbia River Highway Historic District: Nomination of the Old Columbia River Highway in the Columbia Gorge to the National Register of Historic Places, Multnomah, Hood River, and Wasco Counties, Oregon." Salem: Oregon Department of Transportation, Highway Division, Technical Services Branch, Environmental Section, 1984.

U.S. Department of Agriculture. Forest Service. Mount Hood National Forest. Supervisor's Office. File "2330-- Development of Sites in Public Sector, Eagle Creek Recreation Area, 4-20."

DATA LIMITATIONS

The original research materials available for the Eagle Creek Bridge are very limited. All maintenance records no longer exist in the Oregon Department of Transportation's Bridge Section in Salem. The only records of this type available are for the replacement structure, constructed in the late 1930s and used as part of a realignment of the Toothrock and Eagle Creek section of U.S. 30 (later part of Interstate 84). Original construction drawings were poorly microfiched several decades ago and the originals were destroyed. Barely legible copies of microfilmed drawings were acquired for research purposes. Finally, because the Eagle Creek Bridge was constructed on the most eastern section of the HCRH in Multnomah County, and after other structures closer to the route's western terminus, it received less mention in newspaper accounts of the road's construction than did other bridges, such as the Latourell Creek Bridge (HAER No. OR-24), the Shepperds Dell Bridge (HAER No. OR-23), and the Moffett Creek Bridge (HAER No. OR-49). It received only brief mention in the Oregon State Highway Department's annual reports.